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changes in stratigraphic classification and correlation, and especially of the truth of his statement on p. 582 that "the separation of the history of the earth into chapters should be based, not upon the unconformities, however great, but upon the changes which life has experienced." There may be disagreement with the theory of isostacy as explained on pp. 365 to 368 and applied on pp. 132, 472, 478, and 651.

Little but praise should be expressed for the illustrations in the book, for almost all of them are clear and well chosen. Most of them are new, and this feature will be appreciated. There are, however, a few mistakes connected with the illustrations. Fig. 103 pictures as a peneplain a surface which is now known not to be a peneplain. Figs. 142 and 145 seem to be misplaced; they do not illustrate the work of mountain glaciers. Figs. 396 B and 414 B are both labeled "Receptaculites ohioensis"; fig. 414 B illustrates R. oweni. The illustrations of various principles described in words, which occur throughout the book, are numerous, well chosen, and altogether laudatory.

There is no general plan for presentation of references in the book. Footnotes giving definite references on specific points are practically wanting. A few general references are given at the ends of chapters in Part I and at the ends of smaller divisions within chapters in Part II. In some cases previously published material is quoted, with or without the name of the author, but without specific reference. Much material is taken from classic geological literature without reference; for instance, material on the geomorphology of the Appalachian Mountains, Murray's classification of marine sediments, metamorphism, the bar theory for salt formation, and the Lafayette formation. The book would be of much greater value as a work of reference if more care had been taken with sources.

As in the case of any such work, Professor Cleland's book has its good points and its points of weakness, in which the good points outnumber and outweigh those of the opposite character.

A. C. T.

Mine Waters. By A. C. Lane. Ann. Rept., Board Geol. and Biol. Surv. (1911), pp. 774-779.

The study of mine waters in the copper district of northern Michigan is of practical interest, first, owing to the effect on boilers of the admixture of the lower strongly saline waters with those of upper levels; secondly, because it seems clear that the character of the water has had a considerable importance in the deposition of the copper. Observation

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covering most of the eastern portion of the peninsula indicates that beneath (1) the layer of relatively free circulating soft surface waters there is (2) an important horizon of sodium chloride waters, beneath which (3) the water is nearly saturated, in many places, with calcium chloride. It is suggested that the lowest waters are connate, indicating therefore the composition of sea water at the time of deposition of the rocks. The presence of copper chlorides in the lower water, the mode of occurrence of the copper deposits, the chemical character of the alterations of the rock, and the low temperature gradient of the region are all thought to be consistent with the theory that the copper has been deposited in zones of relatively low oxidation by the waters. The ultimate source of the copper must be the formation itself, which as a whole carries about 0.02 per cent copper.

Le Revermont, étude sur une région karstique du Jura méridional. By Georges Chabot. Ann. d. Géog., XXII (1913), pp. 339-415. Maps 2.

The Revermont is a fragment of the southern Jura Mountains more or less separated from the main part of the range by the valley of the river Ain. While physiographically and structurally an integral part of the Juras, by reason of its position bordering the fertile plains of La Bresse, it is geographically a dependent of the latter. Coralline and foraminiferal limestone of Sequanien to Kimeridgien (Jurassic) age forms the floor of the Revermont valleys, most of which are in the synclines of the highly folded strata. Local conditions make the work of ground-water very important. Large inclosed depressions or sinks into which surface waters drain are characteristic, and comparatively recently the Suran River has dried up completely in the lower part of its course, the water disappearing beneath the surface. The soil is poor and cultivation difficult. Consequently for a number of years there has been a depopulation of the district.

R. C. M.

A New Gypsum Deposit in Iowa. By G. F. KAY, U.S. Geol. Surv., Bull. 580, pp. 59-64, Fig. 11.

The discovery of a deposit of gypsum in the Mississippian rocks of the central southern portion of Iowa is of scientific interest. The gypsum, with some anhydrite, occurs at a depth of more than 500 feet. Whether it will prove to be of economic importance is undetermined.